Aviation Combat Element (ACE) Legacy Platform Modernization

The Marine Corps has several significant aviation modernization programs underway to restore and enhance the capabilities of its existing aircraft and systems. These modernization efforts are vital to the services' near- to mid-term combat capabilities.

CH-46E

The CH-46E Sea Knight performs medium lift combat missions in the execution of the assault support function of Marine aviation. The CH-46E is fulfilling a critical role in Operation Iraqi Freedom. Sustainability, performance improvement, and payload recovery programs are essential to ensure the platform continues to meet MAGTF and joint war fighting requirements over the next 10 years.

The CH-46E Engine Reliability Program (ERIP) is essential in order to maintain the CH-46E as a viable and supportable airframe until it is fully replaced by the MV-22 Osprey. By replacing the T58-GE-16 engine core and accessories, ERIP will prevent the downward trend in engine health, increase engine reliability, and restore operational power margins, while providing a significant reduction in fleet labor and support costs. ERIP is currently in full rate production and is 53 percent complete. Other modernization efforts include replacing an antiquated engine control system with a much simplified, highly reliable commercial-off-the-shelf (COTS) system reducing the number of components from 12 to 5. A new Aircraft Integrated Maintenance System (AIMS) is also being fielded, which provides real time onboard rotor track and balance and engine setup capability and divests several pieces of expensive support equipment. AIMS monitors aircraft vibration data and key engine parameters real time to facilitate maintenance and provide limit warnings. Sustainability efforts include the replacement of several key wiring harnesses suffering from age and degradation.

The CH-46E will continue to play a vital role in support of the Global War on Terrorism, therefore Aircraft Survivability Equipment Systems are being upgraded, including the missile warning system, countermeasures dispensing system, and IR missile jamming system to mitigate enemy threats. Numerous weight reduction initiatives are also underway targeting 1000 pounds of payload recovery. Lightweight ceramic armor has been procured to replace the original steel armor. A contract has been awarded for lightweight armored crashworthy seats, which will be introduced into the fleet in 2006. CH-46E readiness and utilization rates are at historic highs and the efforts underway will help it safely and effectively perform the mission until retirement.

CH-53E

The CH-53E Super Stallion is a three-engine, long-range, heavy-lift helicopter that supports the assault support function of Marine Aviation. The current fleet of aircraft will begin to reach the end of its fatigue life during this decade, and will require structural modifications to continue in service. In addition to the replacement of this aircraft with the Heavy Lift Replacement (HLR), a comprehensive sustainability program is required to meet effectively MAGTF and joint warfighting requirements over the next 15 years. Key Performance Parameters for HLR include a maximum unrefueled range of 480 nautical miles and the capability to externally lift 27,876 pounds.

Current sustainability initiatives include a T-64 Engine Reliability Improvement Program, Integrated Mechanical Diagnostic System, the Helicopter Night Vision System, and multiple airframe sustainability initiatives designed to keep the structure and support systems viable. These sustainability efforts are designed to address engine time on wing concerns, the degradation of wiring, and structural issues. These efforts will enhance aircrew safety and survivability, while lowering operational costs and maintenance man-hours per flight hour.

Operation Iraqi Freedom highlighted aircraft survivability issues that have been corrected in theater. Remaining aircraft in the continental United States are being upgraded on an accelerated timeline. Improvements include upgrades in missile warning systems, missile countermeasures, small arms protection, and self-defense weapons.

AH-1Z AND UH-1Y

The AH-1 and UH-1 Upgrade Program will ensure that the MAGTF possesses credible rotary-wing attack and utility support platforms for the next 20 years. The H-1 Upgrade Program will provide 100 UH-1Ys and 180 AH-1Zs to the warfighters. The H-1 Upgrade Program is designed to reduce life-cycle costs, significantly improve operational capabilities, and extend the service life of both aircraft. Commonality between aircraft will greatly enhance the maintainability and the ability of deployment of the systems, with the capability to support and operate both aircraft within the same squadron structure.

The Upgrade Program replaces the current two-bladed rotor system on the UH-1N and AH-1W aircraft with a new four-bladed, all-composite rotor system, coupled with a sophisticated fully integrated, state-of-the-art cockpit. In addition to the new main rotor system and cockpit, the H-1 Upgrade will incorporate a new performance-matched transmission, a four-bladed tail rotor and drive system, and upgraded landing gear for both aircraft. The integrated glass cockpit with modern avionics systems will provide a more lethal platform, as well as enhanced joint interoperability through digital architecture.

Overall, the H-1 Upgrade Program brings all previously funded or planned modifications under one umbrella. The program uses components that are 84 percent common between the two aircraft. Through use of shared major components such as drive train, cockpit, and software, logistics support and strategic lift requirements will be greatly reduced, resulting in more space available on amphibious and Maritime Pre-positioning Force ships. Moreover, these improvements will make the Marine Corps' attack and utility helicopter capabilities more compatible with the performance demands of all future warfighting concepts.

Operational enhancements include a dramatic increase in range, speed, payload, and lethality of both aircraft, with a significant decrease in logistics footprint. The UH-1Y will operate at nearly twice the current range (130 nautical mile combat radius) with more than double the payload (3,220 pounds). The AH-1Z will realize similar performance increases, with the ability to carry twice the current load of precision-guided munitions (2,500 pounds).

The H-1 Upgrade Program is an economical and comprehensive upgrade of both UH-1N and AH-1W helicopters, which will resolve existing operational safety issues while significantly enhancing the capability and operational effectiveness of the attack and utility helicopter fleet. A key modernization effort, the H-1 Upgrade will provide a bridge until the introduction of an advanced rotorcraft design. Due to substantial operational demands and aircraft attrition, both resulting from the Global War On Terrorism, the Marine Corps has adopted a "build new" strategy for the UH-1Y beginning in FY06 and is currently examining a "build new" strategy for the AH-1Z, in order to preclude significant inventory shortfalls.

AV-8B

The AV-8B Harrier Open Systems Core Avionics Requirement (OSCAR), which updates obsolete software and computer equipment, has entered service.

OSCAR with Operational Flight Program H2.0 enables the AV-8B to employ both 1000 and 500 pound variants of the Joint Direct Attack Munitions and provides tremendous improvements in radar and Litening advanced targeting pod capability.

The Litening advanced targeting pod provides the AV-8B with a significant improvement in its lethality and survivability. This third-generation, forward-looking infrared set, dual field-of-view TV seeker, and infrared marker provides improved target recognition and identification, while the laser designator and laser spot tracker provide precision targeting capability. Some Litening pods have also been equipped with a video downlink, which allows real-time video to be sent to ground-based commanders and forward air controllers. This facilitates time-sensitive targeting and reduces the risk of fratricide and collateral damage.

In order to maintain a world-class training environment, the two-seat TAV-8B trainers are undergoing an upgrade program that adds new color displays, night vision goggle-compatible lighting, and a more powerful and reliable Rolls Royce Pegasus (408) engine. These improvements are increasing the training capability of the AV-8B fleet replacement squadron, as well as the abilities of our replacement pilots reporting to their fleet squadrons. The enhancements to the Harrier are a critical link for providing continued support to the MAGTF, until the TacAir Integration implementation and Joint Strike Fighter (JSF) transition are complete.

F/A-18

The F/A-18A+ Upgrade (Engineering Change Proposal 583) consists primarily of avionics and hardware upgrades that allow the F/A-18A+ Hornet to process and use updated versions of F/A-18C software and accessories. A large portion of this modification enhances commonality between the "A+" and "C" aircraft, reducing logistics footprint, and pilot and maintenance training requirements, as well as mitigating obsolescence issues. The modified "A+" aircraft is compatible with a Lot XVII F/A-18C aircraft, an aircraft eight years younger. This upgrade also enables the "A+" aircraft to employ all current and programmed future weapons.

Seventy-six aircraft are scheduled to receive the upgrade, enabling the upgraded "A" model aircraft to remain in the active inventory until 2015. These additional, relevant F/A-18 airframes are instrumental in supporting the Navy-Marine Corps TacAir Integration plan.

The F/A-18D Advanced Tactical Airborne Reconnaissance System (ATARS) provides manned airborne tactical reconnaissance capability to the MAGTF. ATARS incorporates multiple sensor

capabilities including electro-optical, infrared, and synthetic aperture radar. ATARS-equipped aircraft carry all sensor capabilities simultaneously, enabling imagery that is selectable by the aircrew in flight. Another significant capability of ATARS is its ability to transmit digitally collected data in near-real time to ground receiving stations. This imagery can be data-linked to various intelligence systems for national exploitation via the Tactical Exploitation Group. Eighteen ATARS sensor suites are now operational in all six Marine Corps F/A-18D squadrons. Digital solid-state recording systems and data link capability are currently being fielded.

The Litening advanced targeting pod provides the F/A-18 with a significant improvement in its lethality and survivability. Litening is the Marine Corps third generation capability for its expeditionary aircraft. This forward-looking infrared sensor, dual field-of-view TV seeker, and infrared marker provides improved target recognition and identification, while the laser designator and laser spot tracker provide precision targeting capability. Some Litening pods have also been equipped with a video downlink.

Based upon Litening pod's proven combat value during recent operations, the Marine Corps has modified expeditionary F/A-18 aircraft to carry the Litening pod. The Litening pod is a proven capability that better enables Marine Aviation to support the MAGTF and Joint Force Commanders.

KC-130

The KC-130 legacy platform modernization and upgrade plan consists primarily of an Avionics Modernization Program (AMP) for the Reserve Component (RC) and Aircraft Survivability Equipment (ASE) upgrades for both the Active Component (AC) and RC inventories. AMP is a joint interest Air Force, Navy, and Marine Corps program that upgrades 28 KC-130T USMC RC aircraft, facilitating solutions to avionics obsolescence issues.

AMP includes upgraded avionics suites to allow compliance with international communications, navigation, and surveillance/air traffic management mandates. The upgrade also incorporates electrical systems improvements, full night-vision lighting capability, and upgraded defensive electronic countermeasure (DECM) provisions, as well as configuration, support, and training commonality improvements across the entire Department of Defense C-130 fleet. The program is scheduled for first delivery in 2009 and completion by 2016.

ASE and DECM modernization of 12 AC aircraft (KC-130F and R series) and 8

RC aircraft (KC-130T series) is complete. An additional 2 KC-130Ts are funded for modernization in 2006. The upgraded DECM suite includes the APR-39A(V)2 upgraded radar warning system, the AAR-47(V)2 upgraded missile warning system, the ALQ-157 infrared countermeasures system, and the ALE-47 countermeasures dispensing system. KC-130F/R series aircraft are scheduled to remain in the inventory at a decreasing rate until the KC-130J is fully fielded in the AC in 2013. A future ASE upgrade to the KC-130T fleet includes the AAR-47(V)2, ALE-47, and ALR-69, and is scheduled for completion in conjunction with the KC-130T AMP.

EA-6B

EA-6B upgrades maintain Marine Prowlers as an essential combat-proven element of the MAGTF and the joint force. The cornerstone of the modification and upgrade plan is the Improved Capabilities III (ICAP III) weapon system for both Marine and Navy EA-6B squadrons. The core of ICAP III is the ALQ-218 digital receiver system. This is the first receiver upgrade to the EA-6B since its fleet introduction more than 30 years ago. The improved receivers will enable more precise jamming, while also improving aircrew situational awareness and reducing life cycle costs.

ICAP III attained initial operational capability for the Navy in FY 2005. The EA-6B's successful re-winging and upgrades will also be critical to maintaining the airframe's viability through 2015.